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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,550	02/06/2002	Tohei Moritani	MTV-038.01	6977

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EXAMINER
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NAFF, DAVID M

ART UNIT	PAPER NUMBER
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1651

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/068,550

Applicant(s)

MORITANI ET AL.

Examiner

David M. Naff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 12, 13, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 9, 10, 11, 14 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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**DETAILED ACTION**

An amendment of 11/15/04 amended claims 1, 3, 5, 7, 8, 10, 12, and 15.

Claims examined on the merits are 1-17, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***

Claims 1-5, 8, 12, 13, 15 and 16 are rejected under 35 U.S.C. 102(b or e) as being anticipated by Ruckenstein et al (AF on 1449) or Ruckenstein et al (6,323,360) for reasons in the previous office action of 9/7/04 and for reasons herein.

Claim 1 and claims dependent thereon are drawn to preparing a gel polymer by polymerizing monomers in the presence of a molecular imprinter that comprises least two polymerizable double bonds and two ionic functional groups connected by a tether containing a breakable covalent bond to form a gel polymer, and treating the polymer with a reagent that breaks the breakable covalent bond in the tether of the imprinter.

Claim 3 and claims dependent thereon are drawn to a monomer having two or more polymerizable double bonds and two or more functional groups connected by a tether that comprises a breakable covalent bond.

Ruckenstein et al (AF) and ('360) disclose a breakable cross-linker monomer that is ethylene glycol di(1-methacryloyloxy)ethyl

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ether. See Figure 1 of AF and cols 1 and 2 of ('360). The monomer has two polymerizable double bonds, two functional groups and a covalent bond breakable by hydrolysis linking the functional groups. The monomer is copolymerized to form a block copolymer, and the  
5 monomer is hydrolyzed to form a linear polymer. See page 3979, under "Introduction" of AF and col 2, lines 21-59 of ('360).

The method and copolymer of Ruckerstein et al (AF) and ('360) are encompassed by the present claims and are the same as claimed. The monomer will inherently be an imprinter in the copolymer of  
10 Ruckenstein et al.

#### ***Response to Arguments***

Applicants urge that the compound of the Ruckenstein et al references does not fall within the scope of the molecular imprinter of the claims in view of the specification disclosing breaking the  
15 bond with an oxidizing agent when the breakable bond is a 1,2-glycol structure or using a reducing agent when the breakable bond is a disulfide link. Applicants point out that the tether of the compound of Ruckenstein et al that connects two methacrylates does not contain a breakable covalent bond since hydrolysis to remove the tether after  
20 polymerization is not the same as breaking a covalent bond.

This argument is unpersuasive. The claims do not require a 1,2-glycol breakable bond or a disulfide link as the breakable bond. The claims encompass the breakable bond being the same as contained by the compound of Ruckenstein et al. Requiring a covalent bond to be  
25 breakable does not exclude the bond being breakable by hydrolysis.

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The hydrolysis of Ruckenstein et al results in the breaking of a covalent bond. The claims do not exclude the tether containing more than one breakable covalent bond as may be contained by the tether of Ruckenstein et al. The claims recite that the tether "comprises" a breakable covalent bond. This encompasses more than one breakable covalent bond in the tether. The specification cannot put limitations into the claims that are not in the claims.

***Claim Rejections - 35 USC § 103***

Claims 1-5, 8, 12, 13, 15 and 16 are rejected under 35 U.S.C.

103(a) as being unpatentable over Lipskier (5,841,493), Domb (5,858,296), Singh et al (6,248,842 B1), Mosbach et al (6,316,235 B1) or Tanaka et al (5,801,221) in view of Ruckenstein et al (AF) or Ruckenstein et al (6,323,360) for reasons in the previous office action and for reasons herein.

The invention and Ruckenstein et al (AF) and ('360) are described above.

Lipskier, Domb, Mosbach et al and Tanaka et al disclose molecular imprinted polymers prepared using a cross-linker and an imprint molecule.

Singh et al disclose a cross-linked chelating polymer produced by substituting an acyclic chelating agent with a polymerizable functional group, complexing the substituted chelating agent with a metal ion, adding a cross-linking monomer, and removing the metal ion to provide a cross-linked polymeric chelating agent templated for the metal ion.

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It would have been obvious to use as a cross-linker to prepare the polymer of Lipskier, Domb, Singh et al, Mosbach et al or Tanaka et al the breakable cross-linker of Ruckenstein et al (AF) or Ruckenstein et al (6,323,360) for its expected function of being capable of being broken after the polymer is formed to form a linear polymer. After breaking, an imprinted polymer will be inherently obtained. Since the resulting polymer can bind a molecule for which it is imprinted, the polymer can be considered a separation material and sensor.

#### ***Response to Arguments***

Applicants urge that none of the references includes a tether comprising a breakable covalent bond. However, for reasons set forth, the covalent bonds, which can be broken by hydrolysis, of the compound of Ruckenstein et al, are breakable covalent bonds. Hydrolysis of a covalent bond inherently breaks the bond. As noted above, the claims do not exclude a tether containing more than one breakable covalent bond as may be contained by the tether of the compound of Ruckenstein et al.

#### ***Conclusion***

Claims 6, 7, 9, 10, 11, 14 and 17 are free of the prior art.

The claims are objected to as being dependent on a rejected claim.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In

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the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David M. Naff  
Primary Examiner  
Art Unit 1651

DMN  
2/4/05